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# KEYS AND DIAGNOSES FOR THE FAMILIES OF WESTERN HEMISPHERE PENTATOMOIDEA, SUBFAMILIES OF PENTATOMIDAE AND TRIBES OF PENTATOMINAE (HEMIPTERA)

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*Abstract*.—The families of Pentatomoidea of the Western Hemisphere (Acanthosomatidae, Canopidae, Corimelaenidae, Cydnidae, Cyrtocoridae, Dinidoridae, Megarididae, Pentatomidae, Phloeidae, Scutelleridae, Tessaratomidae), the subfamilies of Pentatomidae (Asopinae, Discocephalinae, Edessinae, Pentatominae, Podopinae), and the tribes of Pentatominae (Halyini, Mecideini, Pentatomini, Sciocorini) are keyed and diagnosed. Edessinae is raised from tribal status and *Pantochlora* Stål included in this subfamily. All Western Hemisphere genera formerly included in Halyini except *Brochymena* Amyot and Serville are removed from this tribe. *Caracia* Stål, *Marghita* Ruckes and *Janeirona* Distant are transferred to Pentatomini. *Janeirona* is a senior synonym of *Zimmerana* Ruckes.

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Identification and classification of many pentatomoids of the Western Hemisphere have been hampered by the lack of a recent conspectus of the taxon. This contribution to such a conspectus may resolve some difficulties.

Our opinions regarding the classification of Western Hemisphere pentatomoids are based on study of the external morphology and genitalia. The genital structure of suprageneric taxa has been characterized when sampling for dissection was sufficiently broad that generalizations could be drawn with confidence, and when such generalizations seem useful in defining a taxon.

We consider 11 taxa of the pentatomoids represented in the Western Hemisphere to merit family rank: Acanthosomatidae, Canopidae, Corimelaenidae, Cydnidae, Cyrtocoridae, Dinidoridae, Megarididae, Pentatomidae, Phloeidae, Scutelleridae, and Tessaratomidae. This classification is traditional, although the canopids, corimelaenids, and megaridids are sometimes regarded as subfamilies of the cydnids. These 4 taxa were treated as subfamilies of the Pentatomidae by McAtee and Mallock (1928, 1933) in the most recent revision of the megaridids, canopids, and corimelaenids. However, the Pentatomidae in the classification of the above authors is equivalent to the Pentatomoidea as currently understood, and their subfamilies should be valued in context. Froeschner (1960) also excluded the canopids, corimelaenids, and megaridids from the cydnids in his revision of the Cynidae of the Western Hemisphere. Kormilev (1955) argued eloquently in favor

of family status for the cyrtocorids but did not formally elevate the taxon from subfamily rank.

We recognize 5 subfamilies of Pentatomidae in the Western Hemisphere: Asopinae, Discocephalinae, Edessinae, Pentatominae, and Podopinae. The conspicuous departure from the usual classification is the elevation of the Edessinae from tribal status. The genus *Pantochlora* Stål, ejected by Kumar (1969) from the Tessaratomidae, is included in the Edessinae.

The Pentatominae of the Western Hemisphere have long been distributed among the tribes Halyini, Mecideini, Pentatomini, and Sciocorini. No reason appears for disturbing this arrangement. We are not in accord with a proposal by Leston (1957) to raise the Mecideini to subfamily rank.

Key to Families of American Pentatomoidea

1. Scutellum covering most of fore wings (Fig. 1) 9
– Scutellum leaving most of fore wings exposed even when scutellum attains apex of abdomen (Fig. 2) 2
2. Scutellum bearing large mesial spine or vertical plate Cyrtocoridae
– Scutellum not so armed 3
3. Metathoracic scent gland orifice near lateral margin of pleuron (Fig. 3); antennae 3-segmented Phloeidae
– Metathoracic scent gland orifice distant from lateral margin of pleuron; antennae 4- or 5-segmented 4
4. Each pair of trichobothria on sternites iii–vii* on large callus located mesad of adjacent spiracle Dinidoridae
– Trichobothria not on large callus, both (if paired) rarely mesad of spiracles on all sternites 5
5. Pronotum extending over base of scutellum Tessaratomidae
– Pronotum ending at base of scutellum 6
6. Tibial spines if present confined to apex of tibiae 7
– Tibiae bearing many spines in addition to those at apex of tibiae and in addition to setae 8

Fig. 1. *Chelysoma scurrilis*. Dorsum. →

Fig. 2. *Moncus obscurus*. Dorsum.

Fig. 3. *Phloea subquadrata*. Scent gland orifice (s.a).

Fig. 4. *Ditomotarsus punctiventris*. Terminal segments of male abdominal venter: sternite viii; pygophore (py).

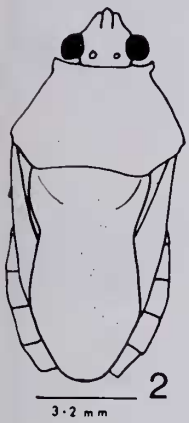
Fig. 5. *Planois gayi*. Pendergrast's organs (pe).

Fig. 6. *Canopus burmeisteri*. Spermatheca: spermathecal dilation (d).

Fig. 7. *Canopis orbicularis*. Aedeagus: median penial lobe (m.p); ejaculatory duct (ej.d); conjunctival appendage (c.a).

Fig. 8. *Cyrtocoris* sp. Spermatheca: spermathecal dilation (d).

* Sternite ii is the first visible sternite.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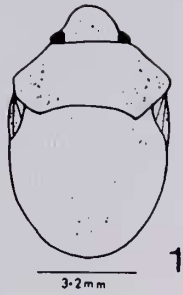
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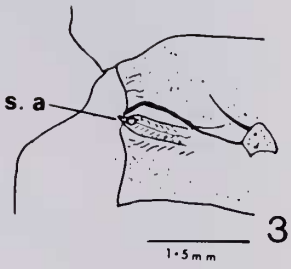
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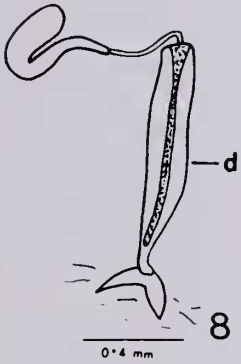
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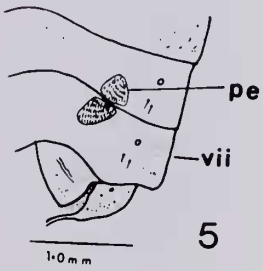
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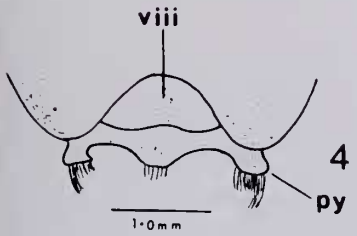
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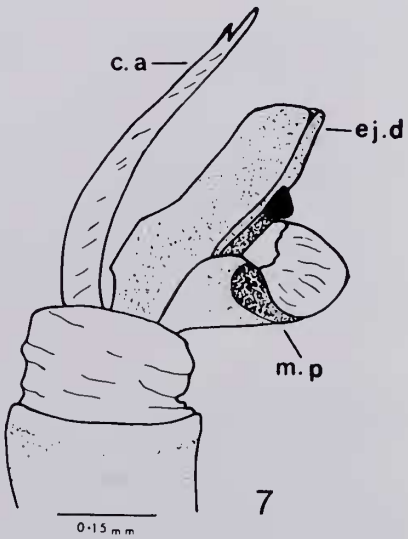
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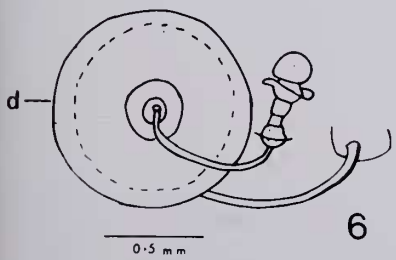
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7. Sternite viii exposed in males (Fig. 4); Pendergrast's organs usually present in females (Fig. 5); tarsi 2-segmented Acanthosomatidae
– Sternite viii concealed in males; Pendergrast's organs absent in females; tarsi usually 3-segmented Pentatomidae
8. Fore tibiae usually expanded, sometimes cultrate with tarsi inserted midway of length, bearing lateral row of especially stout spines unless cultrate; apex of scutellum usually narrowly rounded ..... Cydnidae
– Fore tibiae subcylindrical, spines on lateral margin not notably larger than others; apex of scutellum broadly rounded Corimelaenidae
9. Tarsi 2-segmented Megarididae
– Tarsi 3-segmented 10
10. Tibiae bearing many spines in addition to those at apex and in addition to setae, if weakly spined lateral margins of pronotum fringed with long setae Corimelaenidae
– Tibial spines if present confined to apex 11
11. Sutures of abdominal venter complete, reaching lateral margins; second antennal segment much longer than diameter 12
– Sutures of abdominal venter obsolete laterad of spiracles; length of second antennal segment subequal to diameter Canopidae
12. Trichobothria paired; frena lacking Scutelleridae
– Trichobothria single; short frena present Pentatomidae

## Acanthosomatidae Signoret, 1863

Acanthosomites Signoret, 1863, p. 549.

Tarsi 2-segmented. Sternite viii exposed in males (Fig. 4). One or 2 pairs of Pendergrast's organs usually present in females, these depressed, round or elongate, located laterally on sternites v–vii, vi–vii or sternite vii only, a single depression often extending across more than one sternite (Fig. 5). Scutellum subtriangular, about half or less than half as long as abdomen; frena extending along at least basal 7 tenths of lateral margins of scutellum.

The genera of the Western Hemisphere were keyed by Rolston and Kumar (1974) and the family was revised by Kumar (1974).

## Canopidae Amyot and Serville, 1843

Canopides Amyot and Serville, 1843, p. 70.
Canoparia Horvath, 1919, p. 205.

Scutellum covering most of fore wings, leaving little more than exocorium exposed except at base. Tibiae setose but lacking stout spines. Sutures between abdominal sternites obsolete laterad of spiracles. Tarsi 3-segmented. Antennae 5-segmented; second segment subequal to its diameter. Body obovate, strongly convex, shiny black.

Dilation of spermathecal duct discoidal. Spermathecal pump well developed (Fig. 6). Conjunctival appendages of aedeagus well developed. Median penial lobes fused into trough beneath ejaculatory duct (Fig. 7).

*Canopus* Fabricius, the only genus in this entirely American family, was revised by McAtee and Malloch (1928).

## Corimelaenidae Uhler, 1872

Corimelaenidae Uhler, 1872, p. 471.
Thyreocoridae Van Duzee, 1907, p. 5.
Eucoriinae Sailer, 1945, p. 133.

Scutellum covering most of fore wings, leaving little more than exocoria exposed except basally, or U-shaped, broadly rounded apically, leaving most of fore wings exposed. Fore tibiae neither notably expanded nor cultrate; tibiae bearing in addition to setae numerous spines along length; if only hind tibiae spined and weakly so, then coria and lateral margins of pronotum fringed with long setae. Anterior margins of middle and hind coxae bordered with dense fringe of short setae. Reticulation of eyes not attaining ventral surface of head. Tarsi 3-segmented. Antennae 5-segmented.

In their revision of the corimelaenids, McAtee and Malloch (1933) recognized 9 genera, all from the Western Hemisphere except one monotypic genus.

The structure of the spermatheca and male genitalia varies considerably among genera of corimelaenids, suggesting that further consideration should be given to the suprageneric classification of this family.

*Family name.*—There has been no concensus of opinion on the name of this family, and both Corimelaenidae and Thyreocoridae have been widely used. We believe that Corimelaenidae is the appropriate family name.

Thyreocorides was proposed by Amyot and Serville (1843) as a suprageneric name for 6 genera (*Chlaenocoris, Coptosoma, Heterocratis, Plataspis, Strombosoma* and *Thyreocoris*). However, 7 of the 9 species listed under these genera are plataspids, including the 2 species assigned by Amyot and Serville to *Thyreocoris*: *T. coccinelloides* (Lap.) and *T. punctatus* (Leach). Another species is a canopid (*Canopus impressus* (Fabricius) = *Chlaenocoris impressus*). McAtee and Malloch (1933) left the remaining species, *Strobosoma unipunctatum* Amyot and Serville, unclassified although admitting its affinity to "Thyreocorinae." The principal corimelaenid genera, *Corimelaena* and *Galgupha,* were placed by Amyot and Serville with the scutellerid genus *Odontoscelis* under their supra-generic name Odontoscelides. It would seem therefore that Thyreocorides Amyot and Serville should be regarded as a synonym of Plataspidae since the majority of the

included species are of this family. Certainly it has little or no relevance to the corimelaenids.

Corimelaenidae was introduced casually by Uhler (1872) in connection with notes on *Galgupha nitiduloides* (Wolff) and *Corimelaena extensa* Uhler, both of which he placed in the latter genus. Nevertheless, Uhler's concept of the family clearly included its 2 large genera, and there is no evidence that it extended beyond the present concept of the family. Corimelaenidae appears to be the first family-group name relevant to this taxon that has been widely accepted.

The argument for using Corimelaenidae for this taxon pivots on whether or not Thyreocoridae has been "generally accepted by zoologists interested in the group concerned," a necessary requisite for availability (under Article 11 (e) iii of the International Code of Zoological Nomenclature) of family-group names originally published before 1900 and subsequently fully latinized. The persistence of a dual nomenclature for this family indicates to us the lack of general acceptance of Thyreocoridae, and the reason that this name should not become preeminent we believe to be compelling.

## Cydnidae Billberg, 1820

Cydnides Billberg, 1820, p. 70.

Fore tibiae with row of stout spines along lateral margins, usually expanded, or cultrate with tibiae inserted midway of length. Middle and hind coxae thickly fringed with short setae along anterior margins. Reticulation of eyes reaching ventral surface of head. Scutellum exposing nearly all of fore wings. Tarsi 3-segmented, sometimes absent on hind legs. Antenna 4- or 5-segmented.

Froeschner (1960) recognized 15 genera and 5 subfamilies in his revision of Western Hemisphere representatives of this family.

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Fig. 9. *Cyrtocoris* sp. Aedeagus, lateral view: conjunctival appendage (c.a); ejaculatory reservoir (ej.r); ejaculatory duct (ej.d).

Fig. 10. *Cyrtocoris* sp. Aedeagus, ventral view: theca (t); conjunctival appendage (c.a); ejaculatory duct (ej.d).

Fig. 11. *Dinidor* sp. Spermatheca: accessory spermathecal dilation (a.d).

Fig. 12. *Dinidor* sp. Aedeagus, retracted: ejaculatory reservoir (ej.r); median penial lobe (m.p); ejaculatory duct (ej.d).

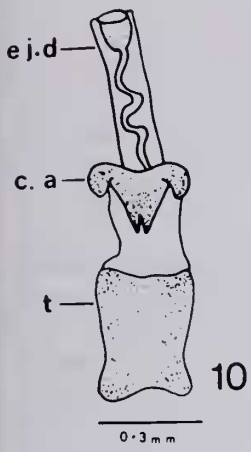
Fig. 13. *Dinidor* sp. Aedeagus, expanded: theca (t); ejaculatory reservoir (ej.r); ejaculatory duct (ej.d).

Fig. 14. *Megaris laevicollis*. Spermatheca.

Fig. 15. *Megaris constricta*. Aedeagus.

Fig. 16. *Alitocoris parvus*. Spermatheca: spermathecal dilation (d).

Fig. 17. *Edessa* sp. Spermatheca: spermathecal dilation (d).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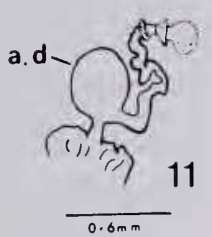
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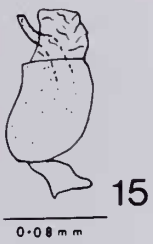
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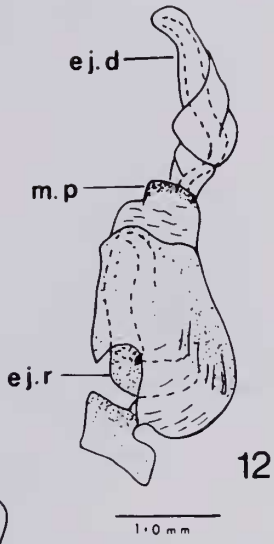
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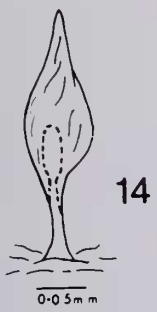
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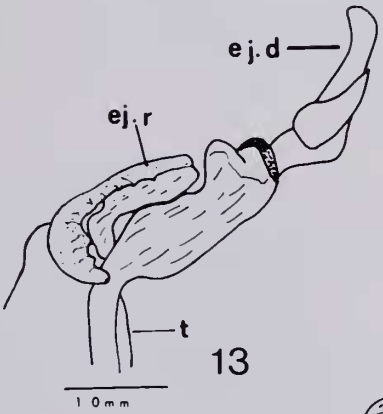
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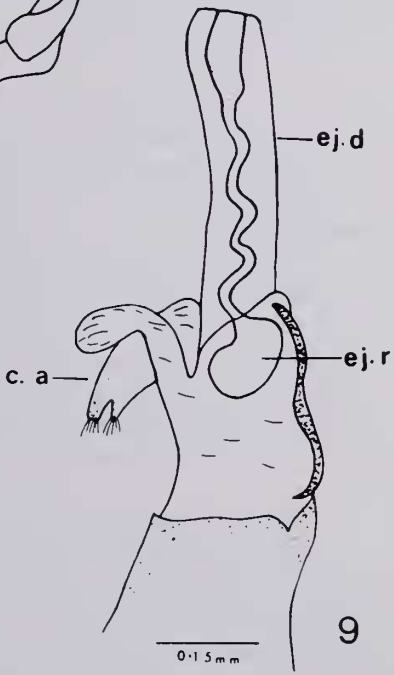
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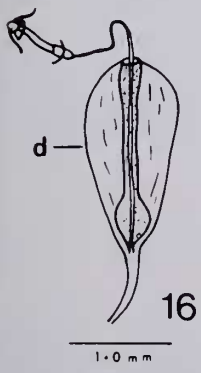
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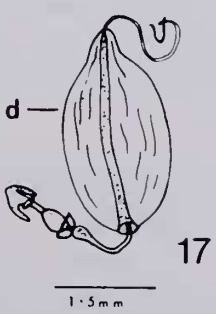
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## Cyrtocoridae Distant, 1880

Oxynotides Amyot and Serville, 1843, p. 58. (part)
Cyrtocorinae Distant, 1880, p. 43.

Body covered with fine setae and waxy granules, the latter often fused. Scutellum extending to apex of abdomen, bearing mesial spine or vertical plate arising on basal half of scutellum and usually sloping dorsocaudad. Abdominal segments iii–vi projecting laterad well beyond coria, ii–v separated at lateral margins; sternites vi–vii laterally and genitalia nearly vertical. Tarsi 2-segmented. Antennae 5-segmented.

Spermatheca terminating in C-shaped bulb, without flanges or obvious pumping mechanism (Fig. 8). Ejaculatory duct of aedeagus large; channel small, sinuous, enlarged distally (Figs. 9, 10). Ejaculatory reservoir eversible. Conjunctival appendages present.

This wholly American family consists of 3 genera and 11 nominal species. Horvath (1916) revised the family and Kormilev (1955) added to this base in his treatment of the representatives occurring in Argentina.

## Dinidoridae Stål, 1870

Dinidorina Stål, 1870, p. 79.
Coridiinae Schumacher, 1924, p. 335.

Each pair of trichobothria located on large callus mesad of spiracular line. Scutellum relatively small, about 4 tenths as long as abdomen, rounded apically. Antennae 4-segmented, distal 3 segments compressed, superior surface of segments 2 and 3 longitudinally impressed.

Spermathecal duct with globular side dilation basally. Spermathecal pump well developed (Fig. 11). Ejaculatory duct of aedeagus fairly voluminous, membranous, surrounded basally by median penial lobes (Figs. 12, 13). Conjunctival lobes apparently absent. Base of ejaculatory duct together with complex spermathecal reservoir completely eversible.

The above diagnosis applies only to the one American genus, *Dinidor* Latreille. Schouteden (1913), in his review of the world genera, listed 6 nominal species in *Dinidor,* one purportedly from Africa and the remainder from the Western Hemisphere.

## Megarididae McAtee and Malloch, 1928

Megaridinae McAtee and Malloch, 1928, p. 1.

Body strongly convex, less than 5 mm long, usually less than 2 mm in length. Scutellum covering most of fore wings, coria little exposed except at base. Tarsi 2-segmented. Antennae apparently 4-segmented, with many setae as long as diameter of segments in female and much longer in male.

Spermatheca simple, saccular or globular (Fig. 14). Flanges and obvious pumping mechanism lacking. Aedeagus with membranous conjunctival lobes (Fig. 15). Ejaculatory duct tubular, simple.

McAtee and Malloch (1928) revised the single genus, *Megaris* Stål, of this wholly American family. McDonald (1979) has reviewed the genitalia.

## Pentatomidae Leach, 1815

Pentatomidae Leach, 1815, p. 121.

Scutellum leaving most of fore wings exposed, usually subtriangular, sometimes elongated and reaching apex of abdomen; disk flat, convex or gibbose basally. Pronotum terminating at base of scutellum. Tibial spines if present confined to apex. Tarsi usually 3-segmented, rarely 2-segmented. Trichobothria rarely located mesad of adjacent spiracle, if so not on large callus, usually paired but sometimes single. Metathoracic scent gland orifice distant from lateral margin of pleuron.

Dilation of spermathecal duct fusiform, membranous, with central invagination around sclerotized tube (Figs. 16, 17). Spermathecal pump usually well developed, with distal and proximal flanges and variously shaped bulb. Ejaculatory reservoir of aedeagus not eversible. Median penial lobes present, sometimes much expanded (Figs. 18, 19, 20). Conjunctival appendages usually present.

### Key to Subfamilies of American Pentatomidae

1. Either first labial segment stout and extending well beyond bucculae, or fore tibiae foliate; pygophoral plate located entad of each paramere (Fig. 25) Asopinae
– First labial segment little enlarged, lying between bucculae (although often projecting beyond bucculae); fore tibiae not greatly expanded; pygophoral plate absent 2
2. Metasternum produced anteriorly onto mesosternum or rarely onto prosternum; rostrum not surpassing mesocoxae Edessinae
– Metasternum rarely produced anteriorly onto mesosternum, rostrum then extending onto abdomen; rostrum usually reaching at least to metacoxae 3
3. Trichobothrium nearest spiracle on sternite vii laterad of imaginary line tangential to spiracular openings on sternites vi and vii by distance at least equal to greatest diameter of spiracular opening (Fig. 26) 4
– At least one trichobothrium on sternite vii in or near imaginary band connecting spiracles and projected caudad of spiracle on sternite vii, or mesad of band 5

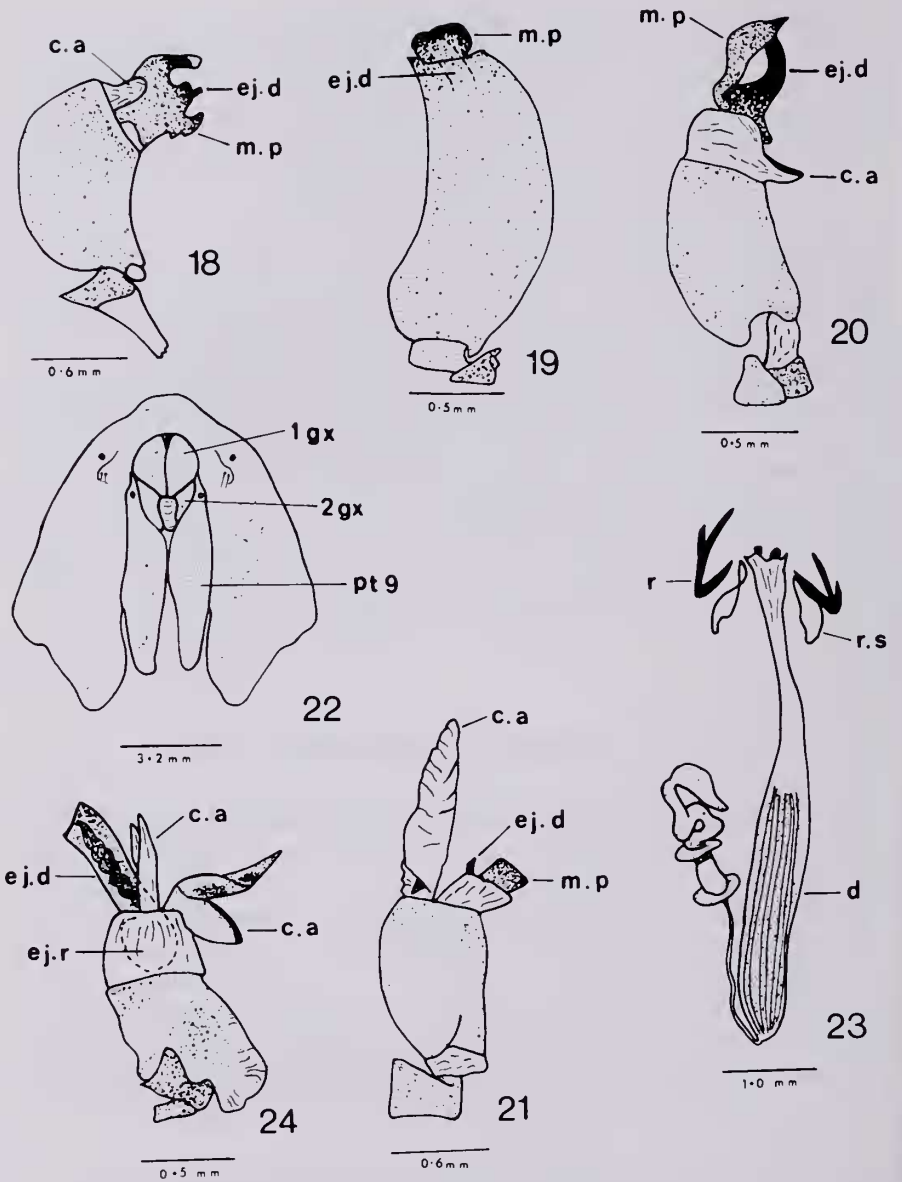


Fig. 18. *Uncinala tau*. Aedeagus: median penial lobe (m.p); ejaculatory duct (ej.d); conjunctival appendage (c.a).

Fig. 19. *Edessa* sp. Aedeagus: ejaculatory duct (ej.d); median penial lobe (m.p).

4. Base of abdominal venter with mesial tubercle and metasternum produced, flattened (in part) Pentatominae
– Abdominal venter rarely tuberculate at base, then metasternum thinly carinate mesially (in part) Discocephalinae
5. Labium arising on or behind imaginary line traversing head at anterior limit of eyes and/or superior surface of 3rd tarsal segment of hind legs shallowly excavated in females (in part) Discocephalinae
– Labium arising before such a line; superior surface of tarsal segments convex or flattened 6
6. Trichobothria single; frena short, less than one-third length of scutellum; scutellum reaching apex of abdomen Podopinae
– Trichobothria paired; frena one-third or more length of scutellum; scutellum not reaching apex of abdomen Pentatominae

## Asopinae Spinola, 1850

Spissirostres Amyot and Serville, 1843, p. 74.
Asopoidae Spinola, 1850, p. 69 (1852). (Asopoideae intended.)
Amyotinae Schouteden, 1906, p. 1.
Arminae Bergroth, 1908, p. 180.
Cimicinae Kirkaldy, 1909, p. 1.

Pygophoral plate located entad of each paramere (Fig. 25). First labial segment usually stout and extending well beyond bucculae; if first labial segment of normal size and lying between bucculae for entire length, fore tibiae foliate. Males often bear pair of large pilose sensory patches, these usually extending across all or part of last 3 abdominal sternites. Tarsi 3-segmented. Antennae 5-segmented.

Schouteden (1906) revised the world genera and listed the nominal species then known of each.

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Fig. 20. *Brochymena cariosa*. Aedeagus: conjunctival appendage (c.a); ejaculatory duct (ej.d); median penial lobe (m.p).

Fig. 21. *Halys neelgirensis*. Aedeagus: median penial lobe (m.p); conjunctival appendage (c.a); ejaculatory duct (ej.d).

Fig. 22. *Phloea subquadrata*. Genital plates: 9th paratergite (pt9); 2nd gonocoxae (2gx); 1st gonocoxae (1gx).

Fig. 23. *Phloea subquadrata*. Spermatheca: spermathecal dilation (d); ring sclerites (r.s); ramus (r).

Fig. 24. *Phloea subquadrata*. Aedeagus: ejaculatory reservoir (ej.r); conjunctival lobes (c.a); ejaculatory duct (ej.d).

## Discocephalinae Fieber, 1860

Discocephalidae Fieber, 1860, p. 26.
Discocephalidum Stål, 1867, p. 499.

Labium usually arising on or posterior to imaginary line traversing head at anterior limit of eyes (Fig. 27). Trichobothria paired, one nearest spiracle on sternite vii usually laterad of imaginary band connecting spiracles and projected caudad of spiracle on sternite vii (Fig. 26). When labium arises before anterior limit of eyes, trichobothrium nearest spiracle on sternite vii laterad of spiracle by distance at least equal to greatest diameter of spiracular opening and/or superior surface of third tarsal segment of hind legs excavated in females. Metasternum not produced anteriorly onto mesosternum. Tarsi 3 segmented. Antennae 4- or 5-segmented.

Spermatheca typically pentatomid with central sclerotized tube in dilation of spermathecal duct and well developed pump (Fig. 16). Theca of aedeagus, ejaculatory duct, median penial lobes and conjunctival appendages (if present) heavily sclerotized, latter fused to margin of theca and permanently exserted (Fig. 18).

All American genera formerly included in the Halyini are removed from this tribe except *Brochymena*. Most of these genera will form a tribe of the Discocephalinae, but *Caracia* Stål, 1872, *Marghita* Ruckes, 1964, and *Janeirona* Distant, 1911 belong in the Pentatomini. The latter generic name is a senior synonym of *Zimmerana* Ruckes, 1962 (=*Zimmeria* Ruckes, 1958).

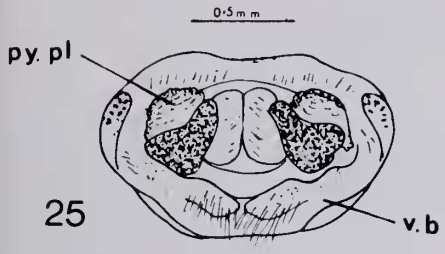
## Edessinae Kirkaldy, 1909

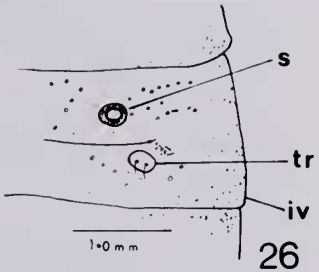
Edessini Kirkaldy, 1909, p. 153.

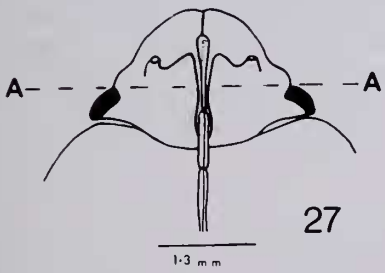
Metasternum produced anteriorly onto mesosternum (onto prosternum in *Pantochlora*) and laterad between mesocoxae and metacoxae; posterior margin notched, receiving mesial tubercle of abdomen; anterior projection bifid (entire in *Pantochlora*). Rostrum terminating in anterior notch of metasternal projection (lying along projection in *Pantochlora*), reaching no farther than mesocoxae. Antennae 4- or 5-segmented. Tarsi 3-segmented.

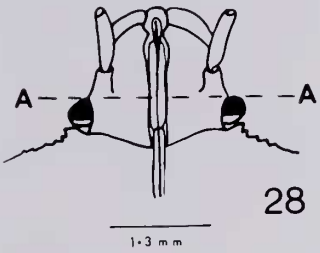
Spermatheca typically pentatomid with central sclerotized tube in dilation of duct and well developed pump (Fig. 17). Theca elongated, slightly curved dorsoventrally (Fig. 19). Median penial lobes small, heavily sclerotized, surrounding short ejaculatory duct except ventrally. Conjunctive inconspicuous, sometimes apparent dorsally as small cone.

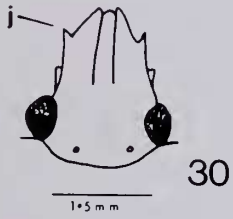
*Pantochlora vivida* Distant, the sole species in the genus, is not remarkably different from other members of the subfamily except in the form of the anterior metasternal projection. The genitalia, which Kumar (1969) has figured, conform to the diagnosis above.



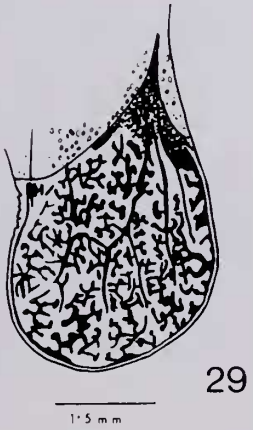




Fig. 25. *Podisus maculiventris*. Pygophore: ventral border (v.b); pygophoral plate (py.pl).
Fig. 26. *Dryptocephala obtusiceps*. Abdominal sternite iv: trichrobothria (tr); spiracles (s).
Fig. 27. *Discocephalessa humilis*. Ventral surface of head.
Fig. 28. *Euschistus tristigmus*. Ventral surface of head.
Fig. 29. *Brochymena quadripustulata*. Membrane of hemelytra.
Fig. 30. *Brochymena parva*. Head, dorsal view.

## Pentatominae Leach, 1815

Pentatomida Leach, 1815, p. 121.

Trichobothria paired, usually at least one of pair on each side of sternites iii–vii on or near imaginary band connecting spiracles on each side, pair rarely well mesad of spiracles. Metasternum rarely produced anteriorly onto mesosternum, if so rostrum reaching metacoxae. Basal segment of labium arising anterior to line traversing head at anterior margin of eyes, not especially stout, lying entirely between bucculae or distal end surpassing bucculae. Scutellum not attaining apex of abdomen, frena extending 4 tenths or more length.

Dilation of spermathecal duct fusiform, membranous excepting sclerotized rod around which dilation invaginates. Pump with proximal and distal flanges. Bulb spherical, digitiform or elongated and diverticulate. Conjunctival lobes usually large, usually bearing membranous appendages and sometimes sclerotized plates, in part or whole retractable into theca. Ejaculatory duct often extending beyond conjunctiva as sclerotized tube (penisfilum), this often looped or coiled.

### Key to Tribes of Pentatominae

1. Abdominal venter with a longitudinal band of striations on each side extending across basal three or more segments Mecideini
– Striations absent on abdominal venter 2
2. Membrane of hemelytra bearing arborescent dark markings (Fig. 29); lateral jugal margins toothed preapically (Fig. 30) Halyini
– Membrane of hemelytra immaculate or with streaks or dots; jugal margins unarmed or with several small teeth 3
3. Lateral margins of pronotum explanate and second antennal segment at least 1.5 times length of third segment Sciocorini
– Lateral margins of pronotum rounded or carinate, if sublaminate second antennal segment less than 1.5 times length of third segment Pentatomini

## Halyini Dallas, 1851

Halydidae Dallas, 1851, p. 150.

Membrane of hemelytra with aborescent dark markings on frosty background (Fig. 29). Preapical tooth present on lateral margin of juga (Fig. 30). Patches of waxy secretion evident on venter. Mesial sulcus extending over several basal sternites on abdomen broad, shallow. Antennae 5-segmented.

In the Western Hemisphere only *Brochymena* Amyot and Serville is closely allied to *Halys* Fabricius. These two genera have similar features,

including the genitalia (Figs. 20, 21). Leston (1953a) suggested that the tribe Halyini might be defined on the basis of wax glands. Wax glands are not unique to the halyines, although they may be a common characteristic of the tribe.

*Brochymena* has been revised by Ruckes (1946).

Mecideini Distant, 1902

Mecidaria Distant, 1902, p. 140.

Abdominal venter with a longitudinal band of striations on each side extending across basal 3 or more segments. Body elongate, linear. Antennae 5-segmented, second segment triangular in cross-section.

The only mecideine genus in the Western Hemisphere, *Mecidea* Dallas, has been reviewed by Sailer (1952).

Pentatomini Leach, 1815

Pentatomidae Leach, 1815, p. 121.

Lateral margins of pronotum usually rounded or carinate from lateral view, if explanate second antennal segment less than 1.5 times length of third segment, usually subequal or shorter. Orifice of metathoracic scent gland often attended by elongate ruga, if auriculate auricle and evaporative area not sunken below metapleural surface. Antennae usually 5-segmented, occasionally 4-segmented.

Sciocorini Amyot and Serville, 1843

Sciocorides Amyot and Serville, 1843, p. 118.

Lateral margins of pronotum explanate. Second antennal segment at least 1.5 times length of third segment. Metathoracic scent gland opening auriculate, auricle and small evaporative area often sunken below surface of pleuron. Antennae 5-segmented.

Podopinae Amyot and Serville, 1843

Podopides Amyot and Serville, 1843, p. 56.
Graphosomini Jakovlev, 1884, p. 204.

Trichobothria single, one behind each spiracle in or near imaginary band connecting spiracles. Frena extending less than one-third length of scutellum. Scutellum reaching apex of abdomen, covering most of fore wings. Antennae 4- or 5-segmented. Tarsi 3-segmented. Pygophoral appendage (hypopygial appendage) often present, attached to posterolateral margin of pygophore.

Barber and Sailer (1953) revised the North American representatives of this subfamily.

## Phloeidae Amyot and Serville, 1843

Phleides Amyot and Serville, 1843, p. 115.

Body extremely depressed; outer margins of juga, pronotum, coria basally and abdomen broadly foliate. Antennae and tarsi 3-segmented. Orifice of metathoracic scent gland near margin of pleuron (Fig. 3).

Ninth paratergites greatly elongated (Fig. 22). Dilation of spermathecal duct sclerotized, cylindrical, striated (Fig. 23). Pump well developed, bulb sinuous. Ring sclerites and sclerotized rami present within vulva. Ejaculatory reservoir of aedeagus eversible (Fig. 24). Channel of ejaculatory duct convoluted. Median penial lobes absent.

The family consists of two American genera, *Phloeophana* Kirkaldy and *Phloea* Lepeletier and Serville, and 3 species. Leston (1953b) monographed the family.

## Scutelleridae Leach, 1815

Scutellerida Leach, 1815, p. 121.
Odontoscelidae Douglas and Scott, 1865, p. 13.
Eurygastridae Douglas and Scott, 1865, p. 13.

Scutellum leaving little of fore wings exposed except basally. Frena absent. Tibiae setose but without spines along length. Suture of abdominal venter extending to lateral margins. Antennae 5-segmented. Tarsi 3-segmented.

Schouteden (1904, 1906) revised the world genera and enumerated the nominal species then known of each.

## Tessaratomidae Stål, 1865

Tessaratominae Stål, 1865, p. 33.

Pronotum projecting over base of scutellum. Metasternum produced laterad between coxae and cephalad onto mesosternum, most strongly produced as anterior wedge reaching nearly to procoxae, posterior margin transverse at junction with abdominal sternite. Six pairs of spiracles usually visible.

The only genus represented in the Western Hemisphere, *Piezosternum* Amyot and Serville, contains 3 species. The genitalia of this genus have been figured by Leston (1954), McDonald (1966) and Kumar (1969).

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